Gender and Business Competencies of Knowledge Workers in Poland

Jolanta Kowal
University of Wrocław, Institute of Psychology, Poland
jolanta.kowal@uwr.edu.pl

Abstract

The purpose of the research described in this article is to verify the influence of gender difference and firm size on the business competencies self-assessment of knowledge workers in small regional enterprises of Lower Silesia region, in Poland, a transition economy. An individual survey was conducted on the basis of the questionnaire of business competencies. Two trials of 169 knowledge workers were constructed via an interpersonal network and sequential random sampling, with the use of passive experimental design. Several dimensions of business competencies are investigated. The results show that females working as knowledge workers in regional small enterprises in Poland manifest less levels of business competencies self-assessment than male colleagues. However, females have the highest scores in sphere of knowledge self-assessment concerning organizational units and organizational responsibility. The novelty is the first use the adapted questionnaire of business competencies self-assessment among knowledge workers in relation to gender and regional small and micro firms, in Poland.

1. Introduction

Effective and successful management of organizations is characterized by factors that lead to economic growth via innovations as new business competencies of knowledge workers. Skilled, highly qualified and innovative employees contribute to organizational performance and make organizations more successful in reaching their goals [17, 23, 31, 43].

In the modern global digital economy, knowledge workers and Information Technology (IT) professionals play an important role in creating business values for organizations [13, 14, 37]. However, not many research studies systematically investigate the business competencies self-assessment of knowledge workers as basis for innovations [20, 25, 27, 38]. Rather little is known about the effects of gender and firms size differences in business competencies self-assessment of knowledge workers working in small regional enterprises, with special treatment of micro-firms, in transition economies [20, 25, 43]. Transition economies are countries in the long process of transforming from centrally planned economies to market economies [42, 43]. They become knowledge economics. The knowledge economy may be defined as production and services based on knowledge-intensive activities contributing to an accelerated pace of technical and scientific advance, and rapid obsolescence [6, 8, 37]. Knowledge economic is characterized by the financial impact on knowledge creation, modification, distribution and use of intellectual capital [6, 7, 8]. Besides that, characteristic for knowledge economies is their stronger reliance on intellectual capabilities than on physical inputs or natural resources [37, 11]. Thus, the role of learning and continuous innovation inside firms constantly increases [11, 12].

The power of the modern knowledge-based economy is based on information systems (IS) and human resources i.e. productive knowledge workers being typically IT professionals [24, 31]. Professional services and other information-rich industries, noted the marked growth in employment in these sectors of the economy since the thirties [11, 35]. The strongly internetworked business systems represent a new source of value for customers and wealth for shareholders. The core competencies of each participant become the key factor of success in this business approach [3, 20, 28, 51]. Therefore, very important role play knowledge workers. The term "knowledge worker" refers to employees who have a high level of education, experience and organizational status and, therefore, allows them to retain considerable autonomy and discretion in carrying out its work [11, 24]. The main capital of knowledge workers is the knowledge. Such workers are for instance IT professionals, software developers, medical doctors, architects, engineers, scientists, public accountants, lawyers, and academics – shortly those whose job is to "think for a living" [3, 23, 24, 31]. It is possible that the ongoing transformation process has a

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substantial impact on business competencies self-assessment of females working in IT in transition economies. There is lack of studies on this issue in academic journals and dealing with ICT in countries that have abruptly abolished a centrally planned economy and one-party controlled political system in favor of a market-driven economy [5, 42, 43, 46].

The business environment of small regional enterprises is nowadays the field of research and practical applications [20, 24, 25]. According to Henderson and Weiler [16] – small and medium enterprises (SMEs) can be characterized as a major engine of economic growth. There is a positive relationship between the share of SMEs in manufacturing and gross domestic product (GDP) per capita growth [20, 24, 25]. The fundamental prerequisite for successful development of all businesses is a favorable business environment [5, 16, 31] in which the enterprise is able to use its innovative capacity including staffs competences. The knowledge-based organization development in transition economies requires information systems (IS) and human resources with productive knowledge workers consisting of IT users and IT professionals [12, 28, 30, 31]. However, business competencies within transition economies are often lower than in other economies [26, 29, 31]. The higher level of business competence can be achieved at individual level by its self-assessment in relation to requirements of social and business environment. Self-consciousness of a little lower level of own business competence can wake up the need for further education and increase of professional skills.

For a country or a region, the key factor for making a complete transition from a transition to developed status is strong and continuous economic growth [42, 43]. Human development and high standards of living in many countries have been equated with education of the population, computer usage, business competencies leading to the ability to innovate [30, 31, 32]. It is essential to determine these business competencies as improving innovation in regional micro and small enterprises in a transition economy, such as Poland. The author assumes that knowledge workers in small and micro enterprises with higher levels of business competencies can support innovation processes. However, the business competencies may be differentiated by gender and firm size of knowledge workers. In this research, knowledge workers were surveyed to examine how they evaluate their own level of business competencies that support innovation in regional, small knowledge-based organizations in transition economies in Poland. Thus, in this work the author attempts to close this gap and test gender and firm size differences in the business competencies of knowledge workers working in small regional enterprises in Lower Silesia district, in Poland, a transition economy. The main research question guiding current study may be formulated in the following way: is there a difference in perceived business competencies self-assessment of female and male knowledge workers in Poland?

The rest of the article has following structure: after a brief literature review, the author presents two main hypotheses; these hypotheses are tested by data collected by an online survey conducted among 169 knowledge workers employed in small regional enterprises in Lower Silesia district in Poland. After discussing the results of current research, the author points to conclusions.

2. Background and Hypotheses

Only little research on business competencies of knowledge workers has been done until now [30, 31, 20, 25]. Although an "obvious gendering in the workforce" is reported [1, 9, 19, 55], most studies report differences in business competencies between female and male knowledge workers as insignificant [10, 19, 41, 48]. In addition, most of the published studies are related to business competencies of employees in developed, mature economies [39, 40]. In contrast, studies about business competencies in transition economies at individual level are rare [20, 26, 31]. Few existing studies on business competencies in transition economies concluded that there are no substantial differences among female and male workers in east-north European countries [1, 2, 22, 34].

It is quite possible, based on fragile human capital framework [20, 25, 26, 27] that studies about business competencies in transition economies in small regional companies might produce different results than previous similar studies conducted in the context of developed economies [20, 23, 26, 31].

Past studies concluded that multiple factors determine the business competencies of IT professionals. However, the results of studies that examined the effects of gender on business competences, assessment of knowledge workers are inconclusive. In contrast, Crump et al. [10] concluded that there is "an obvious gendering in the workforce."

Earlier studies related to business competence in Poland [31] indicated the high importance of two main dimensions: Business Competence (BC) regarding Organization Specific Knowledge, Business Competence regarding Interpersonal and Management Knowledge (Table 2). In current study additional subscale of Business Competence Regarding Intention for Partnership Development (INT) was developed (Tables 2).

It is quite possible that in transition economies such as Poland, business competencies self-assessment as an element of innovative capability will be affected by unique social, business, and cultural environments, as gender and firm size, especially outside the big cities, in regions [20, 25, 31].

To examine this issue in Poland, the author stated the following hypotheses:

Hypothesis 1: The knowledge workers gender affects their business competencies self-assessment.

Hypothesis 2: The size of the firm in which knowledge workers are employed affects their business competencies self-assessment.

Current research model is depicted in Figure 1.

The author built the conceptual model on the basis of the theory of confirmatory factor analysis (CFA) and Structural Equation Modelling [18, 44, 47] and own previous analytic studies [20, 25, 29]. Assumed model includes two parts: 1) the measurement model which relates measured observable variables (Table 2) in rectangles: for example [OVR, …, INT] to hidden, directly unobservable, latent variables (in ellipses: BC, OSK, IMK, Gender, Firm size); 2) the structural model that relates latent variables to one another (Gender→(BC), Firm size→(BC), BC→(OSK, IMK)). Variables d1, d2, o1,…o3 are residuals – that represent an influence of other, unknown variables that were not considered in current model.

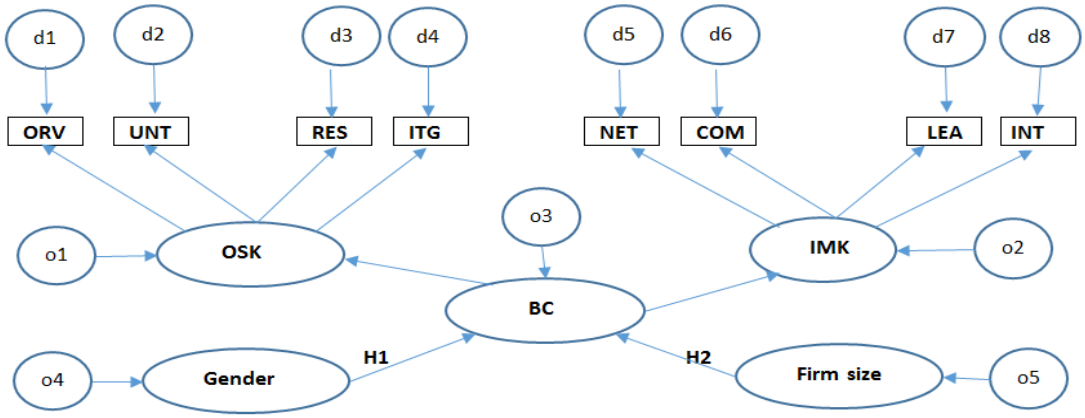

Figure 1. Research Framework

3. Methodology

To measure the dependent variables related to business competencies - the earlier version of the Business Competence (BC) Questionnaire was developed [28]. The survey items, including variable codes, are depicted in Table 2. All items were measured on a 5-point Likert-type scale: very low (1), low (2), neutral (3), high (4), very high (5). The independent variables: gender and firm size were binary coded. For the purpose of multivariate analysis as multiple regression, analysis of variance or factor analysis, the data were transformed into frequencies and standardized [20, 24, 26]. Statistical methods comprised descriptive statistics, point estimation, confidence intervals, hypotheses verification and multivariate analyses. For current study, significant results were presented. Analyzes were performed by the author using statistical software STATISTICA 12.

3.1. Procedural Stages and Questionnaire

Current study is continuation and the next step of adaptation process of the questionnaire of Business Competence, primary prepared by Kowal and Roztocki [31], on the basis of the tool proposed by Bassellier and Benbasat [4]. The questionnaire includes two main dimensions: Business Competence (BC) Regarding Organization Specific Knowledge, and Business Competence Regarding Interpersonal and Management Knowledge (Table 2). Each dimension consists of subscales and each subscale contains concrete items, as depicted in Table 2.

The process of the questionnaire adaptation comprised following stages [18, 25, 27, 36]:

A. Analysis of the starting theoretical positions of the author;

B. Translation and elaboration of the indications for test operation on the basis of the theory, formulation of the test items, the instructions and the name of the test in the language of the users;

C. Approval of the test and verification of the psychometrical characteristics of the each items;

D. Elaboration of the final test version and evaluation of its reliability and validity;

E. Initial standardization of the test to the respective population;

F. Verification of the structural relations between the dimensions of the test;

G. Preparing of methodical indications for application of the test [35, 31, 25, 26].

The coefficients of validity and reliability of the questionnaire and coefficients of the empirical model data fit were very satisfactory and depicted in Table 5-6.

Table 2. Items for Business Competence (Adapted by Kowal and Roztocki from Bassellier and Benbasat (2004))

Dimension		**Business Competence Regarding Organization Specific Knowledge – OSK**
Organizational Overview	OVR1	Rate your level of knowledge of the organization's external environment (e.g. government, competitors, suppliers, and customers)
(OVR)	OVR2	Rate your level of knowledge of the goals and objectives of the organization as whole
	OVR3	Rate your level of knowledge of the core capabilities of the organization
	OVR4	Rate your level of knowledge of the key factors that must go right for the organization to succeed
Organizational Units	UNT1	Rate your level of knowledge of the main challenges that different divisions in the organization face in achieving their objectives.
(UNT)	UNT2	Rate your level of knowledge of the language (e.g. key concepts, jargon, ect.) of the different divisions in the organization
	UNT3	How well do you understand the work processes of the different divisions in your organization?
	UNT4	Rate your level of knowledge of the connections and interdependencies between the various divisions in the organization
Organizational Responsibility	RES1	To what extend do you take actions to stay informed about business development not directly related to IT?
(RES)	RES2	How much do you participate in business activities that are not directly related to IT?
	RES3	To what extent are you concerned by the overall performance of your business organization?
	RES4	To what extent does your work have an impact on the performance of the organization?
IT-Business Integration	ITG1	How experienced are you at recognizing potential ways to exploit new business opportunities using IT?
(ITG)	ITG2	How experienced are you at analyzing business problems in order to identify IT-based solutions (understanding situations, getting the "big picture" identifying underlying root problems, etc.)?
	ITG3	How experienced are you at evaluating the organizational impacts of IT solutions?
	ITG4	Rate your level of knowledge of the alignment between business goals and information systems in the organization as a whole
	ITG5	Rate your level of knowledge of the way IT contributes to the value of the organization
		Business Competence Regarding Interpersonal and Management Knowledge – IMK
Knowledge Networking	NET1	If you have a business question or problem that you cannot solve alone, how confident are you about finding the right person to contact in your organization?
(NET)	NET2	If you have a business question or problem that you cannot solve alone, how confident are you about finding the right contacts outside your organization (consultants, vendors)?
	NET3	If you have a business question or problem that you cannot solve alone, how confident are you about finding other relevant sources of business Information including Internet site, magazines, trade journals, and conferences?
Interpersonal Communication	COM1	In general, how effective do you think you are at communicating with people at different levels of the organization (e.g., with your subordinates, peers, superiors)?
(COM)	COM2	How effective are you at working in a team environment?
	COM3	How well can you communicate about IT matters in non-technical language and within a business context to non-IT specialists?
Leadership	LEA1	In general, how effective do you think you are at managing projects (planning, managing resources, evaluating, etc.)?
(LEA)	LEA2	In general, how effective do you think you are at acting in a leadership role (e.g. establishing direction, directing people, motivating and inspiring, etc.)
	LEA3	Rate your level of knowledge of the existing practices for the management of change in the organization.
	LEA4	Rate your level of knowledge of the risk management practices that can be applied in the organization.
Partnerships Intension	INT1	To what extent are you willing / ready to share responsibility with the company's customers for the development and implementation of future projects?
(INT)	INT2	How much would you be comfortable / you'd be willing / and create their business customers to implement projects that may require more innovative technologies related to the risk?
	INT3	To what extent would you be / you'd be willing / and in the future to develop a strong partnership with business customers?
All items are measured on a 5-point Likert-type scale: very low (1), low (2), neutral (3), high (4), very high (5)		

3.2. Data Collection and Descriptive Analysis

The on-line survey was conducted by the author through the website of the LABSEE in Olsztyn, Poland. From October 2015 to May 2016, 169 knowledge workers of regional small enterprises of region of Lower Silesia completed the survey. The trials construction included the methods of random interpersonal network and sequence sampling [21, 49] with the passive optimal experiment design [20, 50, 53, 54]. Contact information of potential respondents was retrieved from two databases: one compiled by the Centre for Scientific Research of College of Management "Edukacja" and the data of the statistical office of Lower Silesia. These databases comprise several thousand representative addresses of knowledge workers from across the region. The representativeness of the knowledge workers trial was controlled by such variables, as the respondents' age, gender, income level, and the size of the company.
A trial characteristic is described in Table 3.

Table 3. Sample Characteristics – Means and Frequencies

Variables	**Firm size**		**Gender**		**Micro firms**		**Small firms**	
	Micro	Small	Female	Male	Female	Male	Female	Male
Professional groups								
Owner	.40*	.16*	.23*	.32*	.14	.17	.30*	.54*
Director or member of the management board	.15	.10	.10	.15	.09	.12	.11	.20
Manager	.09*	.20*	.13	.15	.20	.19	.09	.09
Specialists - knowledge workers	.46	.48	.43*	.52*	.43*	.52*	.43*	.51*
Officials and personal services workers, vendors, technicians	.55*	.47*	.56*	.46*	.51*	.44*	.60*	.49*
Economic sectors								
Service activities other than those listed below	.30	.25	.20*	.36*	.09*	.37*	.28	.34
Information and communication	.11	.07	.07	.10	.06	.08	.09	.14
Health care and social assistance	.10	.10	.12	.08	.11	.10	.13	.06
Wholesale and retail trade; repair of motor vehicles, etc.	.10	.07	.07	.09	.06	.08	.09	.11
Professional, scientific and technical activity	.09	.08	.09	.08	.14	.04	.04	.14
Education	.07	.08	.11	.05	.14	.04	.09	.06
Agriculture, forestry, hunting and fishing	.07	.00	.05	.02	.00	.00	.09	.06
Business administration services	.06	.11	.04*	.14*	.03*	.17*	.04	.09
Construction	.05	.08	.02	.10	.03	.12	.02	.09
Activities with accommodation and food service	.05	.02	.06	.01	.03	.02	.09	.00
Mining and quarrying	.05	.01	.02	.03	.00	.02	.04	.06
Cultural activities, entertainment and recreation	.04	.03	.06	.01	.06	.02	.06	.00
Water supply, and waste cloths etc.	.02	.01	.01	.02	.03	.00	.00	.06
Transportation and storage	.02	.05	.02	.05	.06	.04	.00	.06
Age (means)	30.82	33.37	28.00*	36.02*	28.51*	36.63*	27.62*	35.11*
Salary level ranks (1-5)	3.07	3.38	2.83*	3.61*	2.97*	3.65*	2.72*	3.54*
Time spent by computer at work in ranks (1 to 3)	2.15*	2.55*	2.05*	2.64*	2.26*	2.75*	1.89*	2.49*
Gender			.57*	.43*	.57*	.43*	.40*	.60*
Education								
Secondary	.33	.31	.32	.32	.29	.33	.34	.31
Bachelor or engineer degree	.38*	.47*	.37*	.48*	.37*	.54*	.36	.40
Master degree	.22	.18	.26*	.15*	.29*	.12*	.23	.20
Postgraduate studies	.07	.03	.06	.05	.06	.02	.06	.09

The results of proportions test and U Mann's Test for ranks. N=169: Differences at the significance level of less than 0.05 ($p < 0.05$) are marked with stars *.

Table 4. Statistical Summary - Results of Means Comparisons of Business Competence Self-assessment in Relation to Gender and Firm Size (Student's T Test)

Means	**Gender**		**Firm size**		**Micro firms**		**Small firms**	
Business Category	Females (N=82)	Males (N=87)	Micro (N=82)	Small (N=87)	Females (N=47)	Males (N=35)	Females (N=35)	Males (N=52)
OSK	3.56*	4.09*	3.73	3.93	3.60*	3.89*	3.51*	4.22*
OVR	3.78*	4.22*	3.93	4.09	3.79*	4.11*	3.77*	4.30*
UNT	3.87*	4.1*5	3.93	4.09	3.91	3.96	3.81*	4.28*
RES	3.50*	4.04*	3.68	3.87	3.59	3.81	3.38*	4.20*
ITG	3.10*	3.94*	3.37*	3.68*	3.13*	3.70*	3.06*	4.10*
IMK	3.53*	3.93*	3.59*	3.87*	3.56	3.62	3.49*	4.13*
NET	3.79	4.23	3.87*	4.16*	3.82	3.92	3.75*	4.44*
COM	3.92	4.25	3.94*	4.23*	3.93	3.96	3.91*	4.44*
LEA	3.71*	4.09*	3.74*	4.06*	3.78	3.69	3.61*	4.36*
INT	3.81*	4.39*	3.94*	4.26*	3.82	4.10	3.79*	4.58*
BC=OSK+IMK	3.55*	4.01*	3.66*	3.90*	3.58	3.77	3.50*	4.18*
The results of Student's T Test for two means. N=169: Differences at the significance level of less than 0.05 (p <0.05) are marked with stars *.								

Table 5. Factor Loadings (λ) and Pearson's Correlation Coefficients (r), N=169, p<0.05

Relation	λ	r
Gender-9->(BC)	0.5	-0.4
Firm Size-10->(BC)	0.51	0.2
(BC)-1->(OSK)	0.78	1
(BC)-1->(IMK)	1	0.9
(OSK)-1->[OVR]	0.85	0.8
(OSK)-2->[UNT]	0.93	0.9
(OSK)-3->[RES]	0.89	0.9
(OSK)-4->[ITG]	0.78	0.9
(IMK)-5->[NET]	0.79	0.9
(IMK)-6->[COM]	0.87	0.9
(IMK)-7->[LEA]	0.88	0.9
(IMK)-8->[INT]	0.67	0.8

Table 6. Model fit in SEM, where AVE - average variance extracted, α – Cronbach's α, r – mean correlation between items, p – observed probability, χ^2/ df , RMSEA, GFI, AGFI - indicators of model fit

Construct	AVE	α	r	χ^2/ *df*	RMSEA	*p*	GFI	AGFI
Model	0.7	0.8	0.1	2.82	<.072	0.06	0.99	0.92
OVR	0.7	0.99	0.9	1.7	<.06	0.17	0.99	0.92
UNT	0.7	0.99	0.9	0.21	<.0001	0.82	0.999	0.99
RES	0.6	0.93	0.4	12	<.15	0.0001	0.91	0.5
ITG	0.77	0.95	0.6	6.29	<.16	0.0001	0.94	0.82
NET	0.77	0.93	0.7	0.01	<.01	0.99	0.99	0.99
COM	0.79	0.92	0.6	0.01	<.01	0.99	0.99	0.99
LEA	0.74	0.87	0.4	11	<.14	<.001	0.93	0.7
INT	0.62	0.75	0.41	0.01	<.01	0.99	0.99	0.99
OSK	0.7	0.94	0.45	2.21	<.09	<.01	0.82	0.8
IMK	0.7	0.92	0.48	2.97	<.10	<.01	0.82	0.8
BC	0.7	0.96	0.45	3.86	<.07	<.01	0.7	0.7

The sample of knowledge workers consisted of 82 female and 87 male respondents. Females in the study were noted to be younger than males. The average age for female respondents was 28 years as compared to 36 years for male respondents. As can be seen from Table 3, males in regional small firms are more often owners, directors or managers, and specialists. Female employees are more likely to be involved in personnel services, or work as vendors, or technicians.

Female knowledge workers are more likely than male to work for micro companies (57 percent female to 43 percent male). Male knowledge workers more often were employed in small firms (40 percent female, 60 percent male). The percentages of employed knowledge workers were in contrast on a country level as previously reported by Kowal and Roztocki [31].

In Lower Silesia region, Poland, knowledge workers were noted to find employment in such sectors as business administration services, information and communication, construction, wholesale and retail trade. These retail trade industries include the repair of motor vehicles, health care and social assistance services, and professional, scientific or other technical functions.

Both sexes as knowledge workers find job in service activities, as business administration services, health care and social assistance, education, professional, scientific and technical activity, information and communication, wholesale and retail

trade; repair of motor vehicles, etc., activities with accommodation and food service, cultural activities, entertainment and recreation, agriculture, forestry, hunting and fishing. Males are employed more frequently than females in service activities, business administration services and in construction.

While earned terminal degrees were comparable among genders, it can be observed that a larger portion of males than females have a Bachelor or an engineering degree. Females, however, dominate the Master degree (Table 3).

4. Results

To find potential gender differences among knowledge workers who took part in the experimental survey, statistical analysis was completed and described below (Table 4 and Table 5).

4.1. The Effect of Gender on BC Self-assessment

According to the results depicted in Table 4 – female subjects evaluate themselves less qualified in global Business Competencies (BC) than their male counterparts (the mean for females Mf= 3.55, the mean for males Mm= 4.01), and in dimension of OSK (Mf= 3.56, Mm= 4.09), and its subscales OVR (Mf= 3.78, Mm= 4.22), UNT (Mf= 3.87, Mm= 4.1), RES (Mf= 3.50, Mm= 4.04), ITG (Mf= 3.10 Mm= 3.94). Less number of differences was related to IMK. The dimension IMK was differentiated globally (Mf= 3.53, Mm= 3.93), and in such subscales as LEA (Mf= 3.71, Mm= 4.09) and INT (Mf= 3.81, Mm= 4.39). There were no differences in subscales: NET (Mf= 3.79, Mm= 4.23), and COM (Mf= 3.92, Mm= 4.25). The differences between females and males are significant for self-assessment of the global BC and its subscales: OSK and IMK. Thus, Hypothesis (H1) seems to be supported.

The effect of gender can be observed in relation to firm size. In small firms that employ from 10 to 49 employees, gender differences have a greater effect on self-assessment of business competencies than in micro firms employing up to 9 persons. This was demonstrated in small firms for dimensions of BC, OSK, ITM and their subscales where females evaluated themselves less competent than males. Such tendencies related to OSK (Mf= 3.51, Mm= 4.22), and its sub-dimensions: OVR (Mf= 3.77, Mm= 4.30), UNT (Mf= 3.81, Mm= 4.28), RES (Mf= 3.38, Mm= 4.20), ITG (Mf= 3.06. Mm= 4.10). Also in the sphere of IMK males evaluate themselves more competent: IMK (Mf= 3.49, Mm= 4.13), NET (Mf= 3.75, Mm= 4.44), COM (Mf= 3.91, Mm= 4.44), LEA (Mf= 3.61, Mm= 4.36), INT (Mf= 3.79. Mm= 4.58). Also, the male assessment of global BC was superior (Mf= 3.50 Mm= 4.18). Females assess themselves best in the scales of COM, UNT, INT, OVR and NET, while males in the dimensions of INT, COM, NET, LEA, OVR, UNT. All males values were assessed as higher throughout the self-assessment In micro enterprises, the gender differences were not as evident. Thus, in micro firms the results concerning IMK are similar in both sexes in all sub-dimensions. The assessments are generally a little higher than middle point of the scale, but they rather are less than 4. So means for both sexes were equal respectively to: IMK (Mf= 3.56, Mm= 3.62), NET (Mf= 3.82, Mm= 3.92), COM (Mf= 3.93, Mm= 3.96), LEA (Mf= 3.78, Mm= 3.69), INT (Mf= 3.82, Mm= 4.10). The differences concerning BC scale were also nonsignificant (Mf= 3.58, Mm= 3.77). Both sexes asses themselves the best in such dimensions as OVR, ITG, COM and UNT. In the dimensions of OSK were observed some significant differences and again females had worse results than males in such scales: OSK (Mf= 3.60, Mm= 3.89), OVR (Mf= 3.79, Mm= 4.11), ITG (Mf= 3.13, Mm= 3.70). There were no effect of gender in the spheres of UNT (Mf= 3.91, Mm= 3.96), RES (Mf= 3.59, Mm= 3.81). Hypothesis H1 seems to be supported here as well. However, the general conclusion is knowledge workers in micro firms evaluate themselves for BC worse than employees in small firms. and males self-assess higher than females across all scales.

4.2. Organizational Size and Business Competencies Self-assessment

Size of an organization or firm have differentiated employees in knowledge economy in their self-assessment of BC. Table 4 lists all dimensions of the construct. To answer the research questions and verify the hypotheses, Pearson's linear correlation coefficients determined the significance of the data. All correlations were significant, between gender, firm size and dimensions of BC. The results are presented in Table 5-6. The proportion test Z and Student T-Test indicate that gender and firm size affect BC self-assessment. The canonical correlation coefficient related to gender, firm size and the business competencies dimensions is statistically significant ($p < 0.05$) with a strength of corr= 0.5, at the moderate level.

4.3. The Global Research Model

In order to examine the hypotheses of the conceptual model depicted in Figure 1, a series of analysis using SEM are listed in Table 5 and 6 [18, 44, 47]. Current proposed empirical SEM confirmed two parts: 1) the measurement model which related measured observable variables [OVR, …, INT] to latent variables (in ellipses: BC, OSK, IMK, Gender, Firm size); 2) the structural model that related latent variables to one another (Gender→(BC), Firm size→(BC), BC→(OSK, IMK)), with variables d1, d2, o1,…o3 as residuals. Tables 5-6 depict empirical correlations and the SEM analysis that confirmed the influence of gender and firm size on BC and its dimensions. Thus main hypotheses H1-H2 and their sub-hypotheses seem to be supported.

5. Conclusions, Discussion, Contribution

Overall, the gender of knowledge workers and firm size of a company in transition economies appear to have an effect on some dimensions of business competencies self-assessment, namely knowledge on organizational overview, organizational units, organizational responsibility, IT-business integration, knowledge networking, interpersonal communication, leadership and intention of partnership development. This conclusion is a little bit different than results of some studies in more developed countries [10, 14, 15, 22, 41] or transition countries [2, 34].

The results of current study showed that gender plays a role in business competencies self-assessment in the knowledge workers profession in regional small enterprises in Poland, a transition economy. The comparison of the results to business competencies studies reported in developed countries [1] shows a more difficult professional position, resulting in less business competencies self-assessment for females working as knowledge workers in small regional enterprises in transition economies, such as Poland. The results of current research show that females who work as knowledge workers in regional small enterprises in Poland manifest (in their own assessment) less levels of business competencies than male colleagues. However female manifest the highest scores in sphere of knowledge concerning organizational units and organizational responsibility. The micro firms have worse economic position, less technological support what can cause less self-efficacy [3] and conviction about knowledge workers less BC.

Females constitute a majority of the unemployed workforce in Poland where these individuals have the same or even higher education than their male counterparts. Often female workers are impacted by the prevailing cultural stereotypes of this gender being responsible for the family and therefore, not focused on the workforce [14, 32, 33]. This stereotype makes a female knowledge worker less attractive to employ in the IT field and often seen as a "family fireside protector" [32, 33].

Current study presented in this paper has a substantial contribution to the existing resources of knowledge economics research for several reasons. First, it may be the first study that examines gender differences on the basis of business competencies self-assessment among knowledge workers in small regional enterprises, in transition economies. Second, the study shows that female knowledge workers in transition economies have a reduced sense of business competencies than their male counterparts. This is unique and different from most findings in developed, mature economies. The majority of these studies claim that gender does not play a role in business competencies among knowledge workers [10, 48]. The conclusions of current study may find practical application in more efficient use of management instruments of regional SME's managers, companies, local governments and politicians, to help females in their more difficult position. Finances from local governments could promote business competency for females within small businesses. Training assistance can provide information about the role of business competence and methods to improve competencies within transitional economies [20, 24, 25].

Creation of new projects for female knowledge workers may benefit them by allowing skills development and competencies with a focus on micro-enterprises [20, 25]. Current conditions are insufficient to help female workers overcome the barriers [15, 32 33]. Improvement in the financial sector, free consulting services, lifelong learning opportunities and tax breaks, could develop economic transformation and can help females to set up and run successfully their own companies. European Union projects are currently seeking new ways of solving inequality and discrimination problems.

Future research avenues may investigate the reasons for job dissatisfaction among female knowledge workers in transition economies with qualitative interview methodology. A different study may examine how business competencies could be improved. This type of study may help to close the existing gap between developed and transition economies [42, 43, 45]. Development of the new strategies, including gender differences, should support innovation, by improving business competencies of knowledge workers in small regional enterprises. It can be also beneficial for other organizations.

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